

What is claimed is:

1 1. A wireless base station that wirelessly communicates
2 with a plurality of mobile stations by using space division
3 multiplexing (SDM), each mobile station sending
4 communication data containing an identifier (ID) to the
5 wireless base station, comprising:

6 association information storing means for storing
7 association information that associates each of the
8 plurality of mobile stations with a different ID;

9 receiving means for receiving data into which
10 communication data sent from the plurality of mobile
11 stations is space-division multiplexed; and

12 extracting means for (a) specifying an ID associated
13 with each mobile station by referring to the association
14 information, and (b) extracting, from the received data,
15 communication data sent from the mobile station by using the
16 specified ID.

1 2. The wireless base station of Claim 1,

2 wherein the association information includes a
3 plurality of IDs and state information that shows the
4 plurality of mobile stations as being associated with the
5 plurality of IDs,

6 wherein the wireless base station further comprises:

7 request receiving means for receiving a request for
8 assignment of a channel from a mobile station out of the
9 plurality of mobile stations; and

10 assigning means for (a) specifying an ID for the
11 requesting mobile station when the request has been
12 received, wherein the specified ID differs from an ID
13 associated with another mobile station, with which the
14 wireless base station currently communicates using the SDM,
15 (b) updating the state information by associating the
16 specified ID with the requesting mobile station, and (c)
17 sending information to the requesting mobile station,
18 wherein the sent information shows the specified ID and a
19 channel assigned to the mobile station.

1 3. The wireless base station of Claim 1, further comprising
2 association deleting means for deleting, when a
3 communication with a mobile station is completed, an
4 association between the mobile station and an associated ID
5 from the association information.

1 4. The wireless base station of Claim 1, further
2 comprising:

3 ID receiving means for receiving an ID from a mobile
4 station out of the plurality of mobile stations; and
5 updating means for updating the association
6 information by associating the received ID with the mobile
7 station that sent the ID when the ID has been received.

1 5. The wireless base station of Claim 1, further
2 comprising:

3 ID receiving means for receiving an ID from a mobile
4 station out of the plurality of the mobile stations; and
5 sending/updating means for (a) referring to the
6 association information when the ID has been received, (b)
7 notifying the mobile station that an ID differing from the
8 received ID should be sent if the association information
9 associates the received ID with another mobile station, and
10 (c) updating the association information by associating the
11 received ID with the mobile station that sent the ID if the
12 association information does not associate the received ID
13 with any mobile station.

1 6. The wireless base station of Claim 1,

2 wherein when the receiving means has received the
3 data, the extracting means also (a) obtains a plurality of
4 first signals from the received data, (b) obtains a second
5 signal estimated to have been sent from each of the
6 plurality of mobile stations, using the plurality of
7 obtained first signals and a plurality of weight vectors
8 that are vector factors, (c) specifies an ID associated with
9 each mobile station by referring to the association
10 information, (d) defines a reference signal containing the
11 specified ID, (e) compares a component of the defined
12 reference signal with a component of the obtained second
13 signal to detect a difference between the two components,
14 each component corresponding to a same predetermined period,
15 (f) adjusts the second signal by adjusting each weight

vector so as to minimize the difference, and (g) regards the adjusted second signal as communication data sent from the mobile station, thereby extracting the communication data.

7. A wireless phone, comprising:

receiving means for receiving an identifier (ID) sent from a wireless base station; and

sending means for sending communication data containing the received ID to the wireless base station.